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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/633,015

07/31/2003

Elena Pavlovskaja

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EXAMINER

WERNER, JONATHAN S

ART UNIT

PAPER NUMBER

3732

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/633,015	Applicant(s) PAVLOVSKAIA ET AL.	
	Examiner JONATHAN WERNER	Art Unit 3732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 and 37-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 21-31, 37-39 is/are rejected.
- 7) ☒ Claim(s) 17-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/11/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to Applicant's amendment received 4/23/08.

Drawings

2. The drawings were received on 4/23/08. These drawings are accepted.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 3/11/08 is noted. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-16, 21-31 and 37-39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jones et al. (US 6,409,504 B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome

by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

5. In regard to claims 1, 14, 16, 21, and 37 Jones et al. disclose a computer implemented method for separating gingiva from a tooth on a computer model of the gingiva and the tooth. The method includes the steps of defining a curved closed cutting surface passing through a line between the gingival and a crown of the tooth, wherein the closed cutting surface comprises a crown portion surrounding the crown of the tooth and a root portion approximating the shape of the root of the tooth, and applying the cutting surface to separate the gingival from the tooth (see especially col. 14, lines 45-58; col. 15, lines 12-26; col. 16, lines 1-5; claim 25). Furthermore, discloses that the cutting surface comprises a series of voxels that define an enclosed cutting surface and are applied to a 3-D volumetric image of the dentition model (column 14, lines 51-58). Although Jones et al. fails to explicitly disclose that the crown portion of the cutting

surface can have a greater volume than that of the crown of the tooth, Examiner notes that requiring a the cutting surface to have a volume greater than that of the volume of the image to be cut is inherent in order to ensure that the separated image is preserved in its entirety during the separation step. Alternatively, it would have at the very least been obvious to one having ordinary skill in the art at the time of Applicant's invention to form the crown portion of the cutting surface to be larger (i.e. greater volume) than that of the crown of the virtual tooth model in the method of Jones et al. in order to ensure the position of the cutting surface is as close as possible to and fully encapsulates the crown of the tooth. As to claims 2-3, 13, and 28-29 Jones discloses that the cutting surface can be expressed as a spline curve that can be fitted to a determined gingival line (column 16, lines 16-20). Additionally, with respect to claims 4-5, and 15, Figure 35 of Jones shows that the portion of partially spherical curve (614) that helps define the boundaries of the cutting surface is parabolic, wherein parabolic curves are normally defined by a quadratic function (i.e. a polynomial of the second degree). With respect to claims 6-7, Examiner further notes that Jones et al. discloses the step of interactively highlighting the gingival (column 14, lines 28-44). As to claims 8-12, Examiner points out that Jones further discloses the step of displaying the cutting surface (600) specified with a plurality of voxels (i.e. 605), said surface representing the gingival line. Figure 35 illustrates an example of the 3-D model of the tooth and separated gingiva, whereby the high curvature location of the tooth surface is shown. In regard to claim 22-26, Jones discloses that the implementation of the method herein described can be realized via a computer program executed by a processor, and wherein said program is tangibly

stored on a machine-readable storage device (column 16, lines 23-34). As to claims 27, 30-31, and 38-39, the voxels of the cutting surface can be represented on a display to allow the user to separate the gingival from the tooth (column 14, lines 51-52).

Allowable Subject Matter

6. Claims 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's remarks regarding the use of the Jones reference have been fully considered but are not found persuasive. Specifically, Applicant remarks that the Jones reference is concerned only with using 2-D slices of a virtual dentition model to separate the virtual teeth from the virtual gingival. However, as described in the rejection above, Jones does disclose that the cutting surface can comprise a series of voxels that define an enclosed cutting surface and are applied to a 3-D volumetric image of the dentition model (column 14, lines 51-58). As an aside, in claim 1 for example, Examiner notes that Applicant has not claimed any limitation that would distinguish the use of 2-D cutting slices from a 3-D cutting curve. In fact, the claimed "computer model of the gingival and the tooth" is not specified by Applicant as being either 2-D or 3-D.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please refer to included form PTO-892 for all additional pertinent prior art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.:

Stytz et al. (US 5,201,035) is directed to a method of removing a volume of a three-dimensional virtual image by utilizing a cutting plane defined by a series of user-manipulable voxels.

Ikezawa et al. (US 5,471,535) is directed to a method of detecting a contour of a virtual image to be separated from another image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN WERNER whose telephone number is (571)272-2767. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on (571) 272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3732

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jonathan Werner/
Examiner, Art Unit 3732

8/2/08

/Cris L. Rodriguez/
Supervisory Patent Examiner, Art Unit 3732